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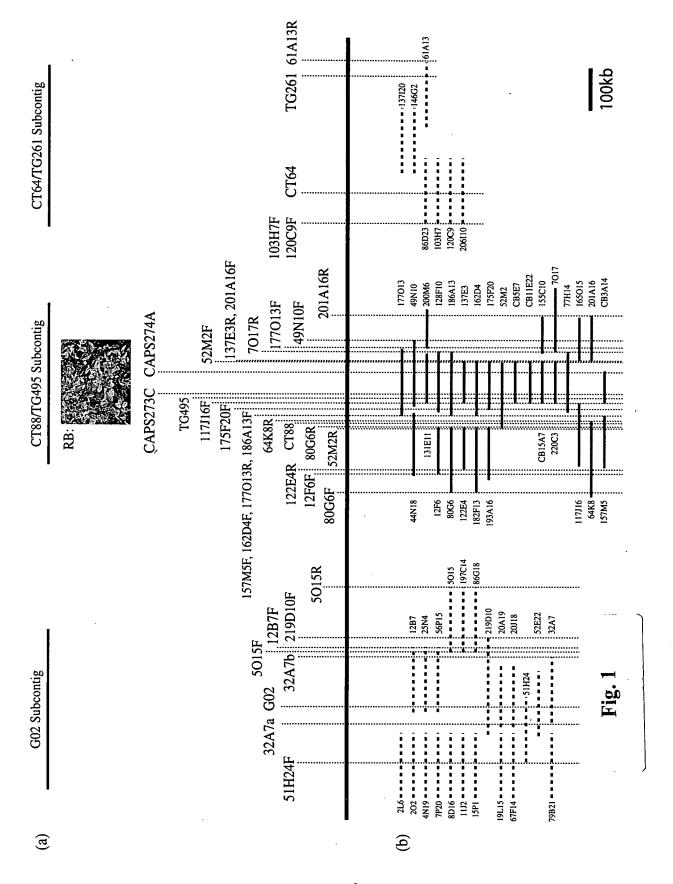
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8/1

Docket No.: WARF-0235
App No.: Not Yet Assigned
Title: Potato Genes For Resistance to Late Blight
Inventors: John P. Helgeson, et al.
Attorney: Leslie E. Aberman
Sheet I of 8

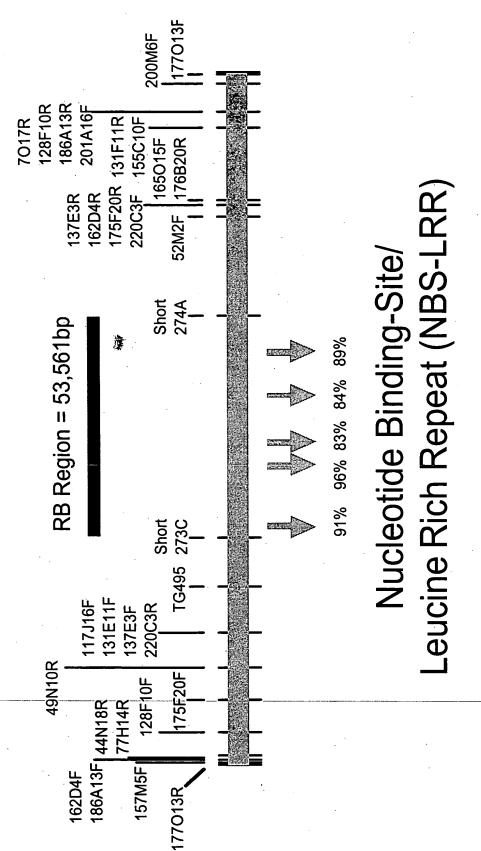
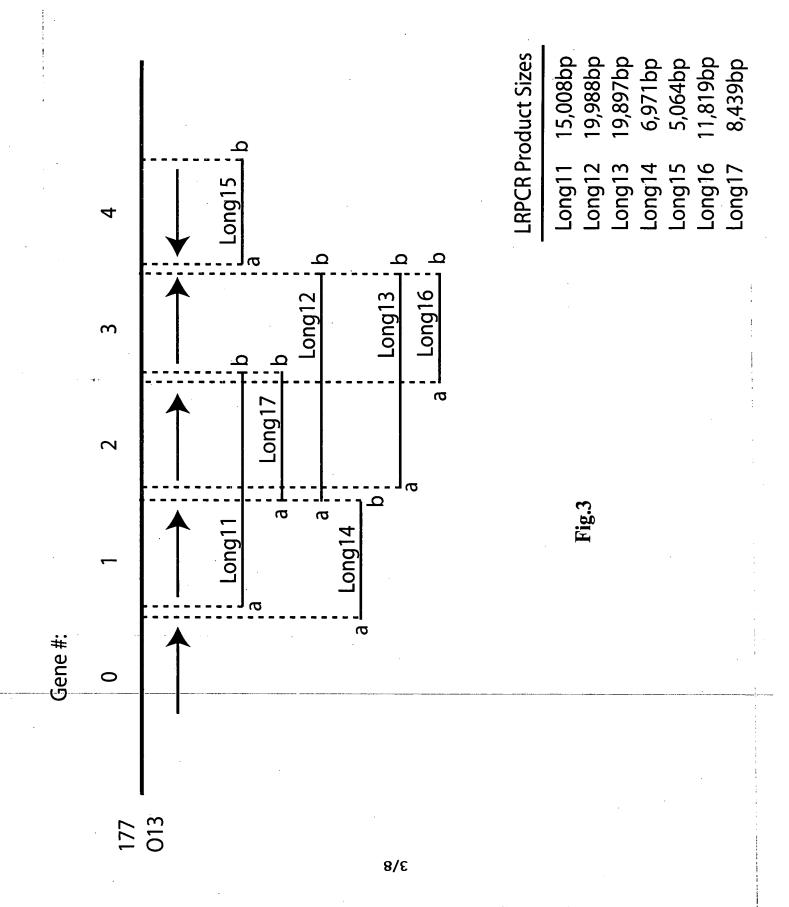


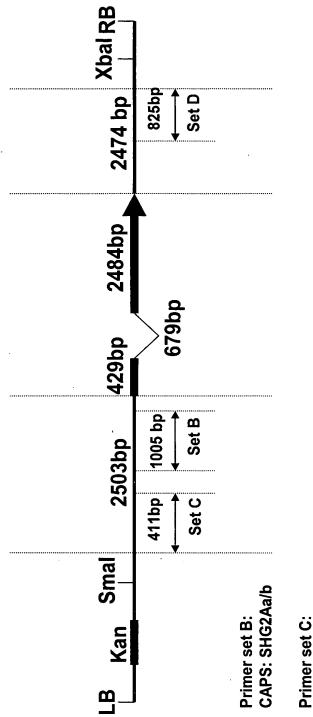
Fig. 2

8/7



Броле: (215) 568-3100 Inventors: John P. Helgeson, et al. App No.: Not Yet Assigned
Title: Potato Genes For Resistance to Late Blight Filed: January 12, 2004

Docket No.: WARF-0235



Primer set C: V159/PF-252RC

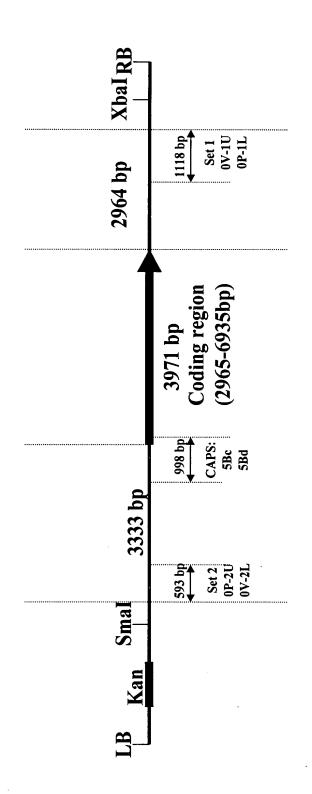
Primer set D: V-556/PR-269RC

Map of 2-4-48 (Gene 2, 8,569 bp)

Fig. 4

8/7

Phone: (215) 568-3100 Inventors: John P. Helgeson, et al. App No.: Not Yet Assigned
Title: Potato Genes For Resistance to Late Blight Filed: January 12, 2004 Docket No.: WARF-0235



Map of 4B6 (Gene 0, 10,268bp)

8/5

Docket No.: WARF-0235
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Sheet 3 of 8 Phone: (215) 568-3100 Filed: January 12, 2004

Docket No.: WARF-0235 App No.: Not Yet Assigned Filed: January 12, 2004 Title: Potato Genes For Resistance to Late Blight Inventors: John P. Helgeson, et al. Attorney: Leslie E. Aberman Phone: (215) 568-3100 6/8

RB RGA1

RGA3

RGA4

RB RGA1

RGA3

RGA4

RB

60 MAEAFIQVLLDNLTSFLKGELVLLFGFQDEFQRLSSMFSTIQAVLEDAQEKQLNNKPLEN MAEAFIQVVLDNLTSFLKGELVLLFGFQDEFQRLSSMFSTIQAVLEDAQEKQLNDKPLEN MAEAFLQVLLDNLTFFIQGELGLVFGFEKEFKKLSSMFSMIQAVLEDAQEKQLKYKAIKN MAEAFLQVLLENLTSFIGDKLVLIFGFEKECEKLSSVFSTIQAVLQDAQEKQLKDKAIEN ****:**:**: *: *: *: *: *: *: *: *: ** *: ** *: *** 120

WLQKLNAATYEVDDILDEYKTKATRFSQSEYGRYHPKVIPFRHKVGKRMDQVMKKLKAIA RB RGA1 WLQKLNAATYEVDDILDEYKTKATRFLQSEYGRYHPKVIPFRHKVGKRMDQVMKKLNAIA RGA3 WLQKLNVAAYEVDDILDDCKTEAARFKQAVLGRYHPRTITFCYKVGKRMKEMMEKLDAIA RGA4 WLQKLNSAAYEVDDILGECKNEAIRFEQSRLGFYHPGIINFRHKIGRRMKEIMEKLDAIS * * :*:*:**:*:*: : 180

RB EERKNFHLHEKIVERQAVR--RETGSVLTEPQVYGRDKEKDEIVKILINNVSDAQHLSVL EERKKFHLQEKIIERQAAT--RETGSVLTEPQVYGRDKEKDEIVKILINTASDAOKLSVL RGA1 RGA3 EERRNFHLDERIIERQAAR--RQTGFVLTEPKVYGREKEEDEIVKILINNVSYSEEVPVL RGA4 EERRKFHFLEKITERQAAAATRETGFVLTEPKVYGRDKEEDEIVKILINNVNVAEELPVF *:** ****:**:**:**

> 240 PILGMGGLGKTTLAQMVFNDQRVTEHFHSKIWICVSEDFDEKRLIKAIVESIEGRPLLGE PILGMGGLGKTTLSQMVFNDQRVTERFYPKIWICISDDFNEKRLIKAIVESIEGKSLS-D PILGMGGLGKTTLAQMVFNDQRITEHFNLKIWVCVSDDFDEKRLIKAIVESIEGKSLG-D

> PIIGMGGLGKTTLAQMIFNDERVTKHFNPKIWVCVSDDFDEKRLIKTIIGNIE-RSSPHV

300 MDLAPLQKKLQELLNGKRYLLVLDDVWNEDQQKWANLRAVLKVGASGASVLTTTRLEKVG RB RGA1 MDLAPLQKKLQELLNGKRYFLVLDDVWNEDQHKWANLRAVLKVGASGAFVLTTTRLEKVG RGA3 MDLAPLQKKLQELLNGKRYFLVLDDVWNEDQEKWDNLRAVLKIGASGASILITTRLEKIG RGA4 EDLASFQKKLQELLNGKRYLLVLDDVWNDDLEKWAKLRAVLTVGARGASILATTRLEKVG

360 RB SIMGTLQPYELSNLSQEDCWLLFMQRAFGHQEEINPNLVAIGKEIVKKSGGVPLAAKTLG SIMGTLQPYELSNLSPEDCWFLFMQRAFGHQEEINPNLMAIGKEIVKKCGGVPLAAKTLG RGA1 RGA3 SIMGTLQLYQLSNLSQEDCWLLFKQRAFCHQTETSPKLMEIGKEIVKKCGGVPLAAKTLG RGA4 SIMGTLQPYHLSNLSPHDSLLLFMQRAFGQQKEANPNLVAIGKEIVKKCGGVPLAAKTLG

GILCFKREERAWEHVRDSPIWNLPQDESSILPALRLSYHQLPLDLKQCFAYCAVFPKDAK RGA1 GILRFKREEREWEHVRDSPIWNLPQDESSILPALRLSYHHLPLDLRQCFVYCAVFPKDTK RGA3 GLLRFKREESEWEHVRDSEIWNLPQDENSVLPALRLSYHHLPLDLRQCFAYCAVFPKDTK RGA4 GLLRFKREESEWEHVRDNEIWSLPQDESSILPALRLSYHHLPLDLRQCFAYCAVFPKDTK

480 RB MEKEKLISLWMAHGFLLSKGNMELEDVGDEVWKELYLRSFFOEIEVKDGKTYFKMHDLIH RGA1 MAKENLIAFWMAHGFLLSKGNLELEDVGNEVWNELYLRSFFQEIEVESGKTYFKMHDLIH RGA3 IEKEYLIALWMAHSFLLSKGNMELEDVGNEVWNELYLRSFFQEIEVKSGKTYFKMHDLIH RGA4 MIKENLITLWMAHGFLLSKGNLELEDVGNEVWNELYLRSFFQEIEAKSGNTYFKIHDLIH

Docket No.: WARF-0235
App No.: Not Yet Assigned Fi
Title: Potato Genes For Resistance to Late Blight
Inventors: John P. Helgeson, et al.
Attorney: Leslie E. Aberman Pl
Sheet 7 of 8 Filed: January 12, 2004

Phone: (215) 568-3100

7/8

	540
RB RGA1 RGA3 RGA4	DLATSLFSANTSSSNIREINKHSYTHMMSIGFAEVVFFYTLPPLEKFISL DLATSLFSANTSSSNIREINANYDGYMMSIGFAEVVSSYSPSLLQKFVSL DLATSMFSASASSRSIRQINVKDDEDMMFIVTNYKDMMSIGFSEVVSSYSPSLFKRFVSL DLATSLFSASASCGNIREINVKDYKHTVSIGFAAVVSSYSPSLLKKFVSL ****: ** *: :::::::*: 600
RB RGA1 RGA3 RGA4	RVLNLGDSTFNKLPSSIGDLVHLRYLNLYG-SGMRSLPKQLCKLQNLQTLDLQYCTKLCC RVLNLRNSNLNQLPSSIGDLVHLRYLDLSGNFRIRNLPKRLCKLQNLQTLDLHYCDSLSC RVLNLSNSEFEQLPSSVGDLVHLRYLDLSG-NKICSLPKRLCKLQNLQTLDLYNCQSLSC RVLNLSYSKLEQLPSSIGDLLHLRYLDLSC-NNFRSLPERLCKLQNLQTLDVHNCYSLNC **** * :::***::****: * . * * 660
RB RGA1 RGA3 RGA4	LPKETSKLGSLRNLLLDGSQSLTCMPPRIGSLTCLKTLGQFVVGRKKGYQLGELGNLNLY LPKQTSKLGSLRNLLLDG-CSLTSTPPRIGLLTCLKSLSCFVIGKRKGHQLGELKNLNLY LPKQTSKLCSLRNLVLDH-CPLTSMPPRIGLLTCLKTLGYFVVGERKGYQLGELRNLNLR LPKQTSKLSSLRHLVVDG-CPLTSTPPRIGLLTCLKTLGFFIVGSKKGYQLGELKNLNLC ***:*** ***:*:*
RB RGA1 RGA3 RGA4	GSIKISHLERVKNDKDAKEANLSAKGNLHSLSMSWNNFGPHIYESEEVKVLEALKPHSNL GSISITKLDRVKKDTDAKEANLSAKANLHSLCLSWDLDGKHRYDSEVLEALKPHSNL GAISITHLERVKNDMEAKEANLSAKANLHSLSMSWDRPNRYESEEVKVLEALKPHPNL GSISITHLERVKNDTDA-EANLSAKANLQSLSMSWDNDGPNRYESKEVKVLEALKPHPNL *:*.*::*:**:**:** 780
RB RGA1 RGA3 RGA4	TSLKIYGFRGIHLPEWMNHSVLKNIVSILISNFRNCSCLPPFGDLPCLESLELHWGSADV KYLEINGFGGIRLPDWMNQSVLKNVVSIRIRGCENCSCLPPFGELPCLESLELHTGSADV KYLEIIDFCGFCLPDWMNHSVLKNVVSILISGCENCSCLPPFGELPCLESLELQDGSVEV KYLEIIAFGGFRFPSWINHSVLEKVISVRIKSCKNCLCLPPFGELPCLENLELQNGSAEV . *: * * :: *: *: *: *: *: *: * ** ********
RB RGA1 RGA3 RGA4	EYVEEVDIDVHSGFPTRIRFPSLRKLDIWDFGSLKGLLKKEGEEQFPVLEEMIIHECPFL EYVEDNVHPGRFPSLRKLVIWDFSNLKGLLKMEGEKQFPVLEEMTFYWCPMF EYVEDSGFLTRRFPSLRKLHIGGFCNLKGLQRMKGAEQFPVLEEMKISDCPMF EYVEEDDVHSRFSTRRSFPSLKKLRIWFFRSLKGLMKEEGEEKFPMLEEMAILYCPLF ***: ***: * ****: * ****: * ****: * ****: * ***: * 900
RB RGA1 RGA3 RGA4	TLSSNLRALTSLRICYNKVATSFPEEMFKNLANLKYLT VIPTLSSVKTLKVI-VTDATVLRSISNLRALTSLDISDNVEATSLPEEMFKSLANLKYLK VFPTLSSVKKLEIWGEADAGGLSSISNLSTLTSLKIFSNHTVTSLLEEMFKNLENLIYLS VFPTLSSVKKLEVHGNTNTRGLSSISNLSTLTSLRIGANYRATSLPEEMFTSLTNLEFLS .:
RB RGA1 RGA3 RGA4	ISRCNNLKELPTSLASLNALKSLKIQLCCALESLPEEGLEGLSSLTELFVEHCNMLKCLP ISFFRNLKELPTSLASLNALKSLKFEFCDALESLPEEGVKGLTSLTELSVSNCMMLKCLP VSFLENLKELPTSLASLNNLKCLDIRYCYALESLPEEGLEGLSSLTELFVEHCNMLKCLP FFDFKNLKDLPTSLTSLNALKRLQIESCDSLESFPEQGLEGLTSLTQLFVKYCKMLKCLP**:*********************************
RB RGA1 RGA3 RGA4	EGLQHLTTLTSLKIRGCPQLIKRCEKGIGEDWHKISHIPNVNIYI EGLQHLTALTTLTITQCPIVFKRCERGIGEDWHKIAHIPYLTLYE EGLQHLTTLTSLKIRGCPQLIKRCEKGIGEDWHKISHIPNVNIYI EGLQHLTALTNLGVSGCPEVEKRCDKEIGEDWHKIAHIPNLDIH- ******: ** : ** : ***:: ******* : ::

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Attorney: Leslie E. Aberman Phone: (215) 568-3100

Attorney: Leslie E. Aberman Sheet 8 of 8

8/8

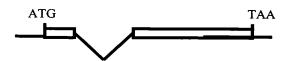


Fig. 7a

MAEAFIQVLLDNLTSFLKGELVLLFGFQDEFQRL SSMFSTIQAVLEDAQEKQLNNKPLENWLQKLNAA TYEVDDILDEYKTKATRFSQSEYGRYHPKVIPFR HKVGKRMDQVMKKLKAIAEERKNFHLHEKIVERQ AVRRETGSVLTEPQVYGRDKEKDEIVKILINNVS DAQHLSVLPILGMGGLGKTTLAQMVFNDQRVTEH FHSKIWICVSEDFDEKRLIKAIVESIEGRPLLGE MDLAPLQKKLQELLNGKRYLLVLDDVWNEDQQKW ANLRAVLKVGASGASVLTTTRLEKVGSIMGTLQP YELSNLSQEDCWLLFMQRAFGHQEEINPNLVAIG KEIVKKSGGVPLAAKTLGGILCFKREERAWEHVR $ext{DSPIWNLPQDESSILPALRLSYH} \underline{QLPL} ext{DLKQ} \underline{CFA}$ $oldsymbol{Y}$ CAVFPKDAKM $oldsymbol{E}$ KEKLISLWMAHGFLLSKGNMEL EDVGDEVWKELYLRSFFQEIEVKDGKTYFK**MHD**L IHDLATSLFSANTSSSNIREINKHSYTHMMSIGF AEVVFFYTLPP

LEKFISLRVLNLGDSTFNKLPSS IGDLVHLRYLNLYGSGMRSLPKQ LCKLQNLQTLDLQYCTKLCCLPKE TSKLGSLRNLLLDGSQSLTCMPPRIGS LTCLKTLGQFVVGRKK GYQLGELGNLNLYG SIKISHLERVKNDKDAKEAN LSAKGNLHSLSMSWNNFGPHIYE SEEVKVLEALKPHSNLT SLKIYGFRGIHLPEWMN HSVLKNIVSILISNFRNCSCLPP FGDLPCLESLELHWG SADVEYVEEVDIDVHSGFPT RIRFPSLRKLDIWDFGSLKGLLKKEG EEQFPVLEEMI IHECPFLTL SSNLRALTSLRICYNKVATSFPEEM FKNLANLKYLTISRCNNLKELPTS LASLNALKSLKIQLCCALESLPEEG LEGLSSLTELFVEHCNMLKCLPEG LQHLTTLTSLKIRGCPQLIKRCEKGIGED WHKISHIPNVNIYI

Fig. 7b